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Columbia Gas engineer's failures at root of gas explosions, NTSB says



JESSICA RINALDI/GLOBE STAFF/FILE

Firefighters battled one of the blazes caused by the gas explosions in Lawrence in September.

By [Milton J. Valencia](#)

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Federal investigators Thursday singled out a Columbia Gas engineer with “limited knowledge” for errors in drafting work plans for a Lawrence construction site, setting in motion a chain of events that led to the [Sept. 13 natural gas explosions](#) that killed one man and left thousands without heat and hot water. In the most detailed accounting to date of the catastrophe, the National Transportation Safety Board

identified a series of missteps by the utility at the planning stages for a gas main replacement project in South Lawrence. The agency recommended “urgent” steps to increase oversight within the company and at the state level.

The NTSB investigators have focused on the replacement project and the failure of the engineer planning that job to account for a critical sensor in a line that was being replaced. Once the line was disconnected, the sensor detected a loss in gas pressure that caused the system to pump a huge amount of gas into live lines, leading to more than 120 fires and explosions across Lawrence, North Andover, and Andover, the report found.

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“The Columbia Gas field engineer who developed the engineering plans told NTSB investigators that he developed them without reviewing engineering drawings that documented the regulator-sensing lines,” the NTSB said in its report.

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Moreover, the agency found the “field engineer had limited knowledge about the importance of the regulator-sensing lines or the consequences of losing the capability to sense the main pressure via the regulator-sensing lines.”

And the NTSB noted that engineers from other departments within Columbia Gas did not review the plans because the field engineer did not believe they needed to.

The NTSB has previously identified overpressurization as the cause of the disaster, triggered by the live sensing line left in the abandoned pipe. But the new report strongly implies the chain of events began back when Columbia Gas employees drew up work plans for the area.

The agency also questioned why Columbia Gas, years earlier, had abandoned a practice of having a field

technician onsite at construction jobs to monitor any work that involved depressurizing main lines.

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“If a pressure anomaly occurred, the technician could quickly act to prevent an overpressurization action,” the NTSB said. “Columbia Gas offered no explanation as to why this procedure was phased out.” The NTSB did not identify the Columbia Gas engineer by name in its report, and the utility declined to do so.

NiSource Inc., the corporate parent of Columbia Gas of Massachusetts, has declined to answer questions about the cause of the explosions, saying it is part of the NTSB investigation and cannot discuss the incident. It has acknowledged to investors a previous Globe report that the US attorney in Boston is investigating whether the company can be held criminally liable for the disaster.

In a statement, NiSource said that it is working closely with federal investigators and that it “has identified, and moved ahead with, new steps to enhance system safety and reliability and to safeguard against over-pressurization.”

Those include installing new safety valves across the company’s network that would automatically shut off a system when overpressurization is detected. The valves are meant to serve as an extra layer of protection when basic systems, such as the one in Lawrence, fail. Columbia will also deploy remote devices to monitor pressure at regulating stations in real time. Those devices were not installed at the time of the Lawrence disaster.

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NiSource chief executive Joe Hamrock said in an interview at the Globe last week that the new measures are not required by law. But, “we stepped back and looked broadly . . . at how can we take another step in ensuring safety around the pressure systems.”

The Globe has previously reported that Columbia updated several of its internal policies days after the explosions to require additional oversight and safeguards when performing similar underground pipework, raising questions of whether the protocols could have prevented the disaster. Columbia construction crews must now verify the location of sensing lines before they begin work and conduct field surveys to make sure drawings are accurate.

One industry safety specialist said the new recommendations from the NTSB Thursday were unusual

because the agency has still not completed its final report on the Merrimack Valley disaster.

“They’re raising issues to say, ‘We find these things are serious, and serious and urgent enough to make a public announcement before we have a final report done,’ ” said Richard Kuprewicz, a pipeline safety specialist who serves as an adviser to the US Pipeline and Hazardous Materials Safety Administration. Kuprewicz said he expects the recommendations would reverberate across the natural gas industry as utilities review their internal policies. He said failures in natural gas systems are often caused in part by unclear or nonexistent procedures, the failure of employees to follow them, or a combination.

“An overpressure event on a gas distribution system is an extreme event, which underscores that something went really wrong here and in more than one area,” he said. “It’s real important to have certain processes in place to make sure you don’t make mistakes.”

The NTSB also recommended the state of Massachusetts require that a licensed professional engineer, who has higher levels of training and certification than other professionals, sign off on all utility work. While many states do not set out such a requirement, the NTSB said a professional engineer could have caught the omissions and prevented the disaster.

“A [professional engineer] seal on a plan would illustrate that the plan had been approved by an accredited professional with the requisite skills, knowledge, and experience to provide a comprehensive review,” the NTSB said.

A spokeswoman for the Massachusetts Department of Public Utilities said the state agency “is in the process of reviewing the recommendations and will work with the Legislature to fully comply with the NTSB safety recommendations.”

Senators Edward J. Markey and Elizabeth Warren, who have been critical of Columbia Gas’s handling of the disaster, said in a statement Thursday that the company “failed to prioritize safety when conducting those projects.”

“And it failed its customers, the residents of the Merrimack Valley, and the public trust,” the senators said.

The senators, along with Representatives Seth Moulton and Niki Tsongas, plan to hold a congressional field hearing in Lawrence on Nov. 26. Markey also sent a letter to Columbia earlier this week asking questions similar to the issues raised in the NTSB report.

“In response to our questions on how and why Columbia Gas could have been operating so blindly and so dangerously, the company has provided us with inadequate answers and tragically deficient company policies,” the senators said in a joint statement.

Matt Rocheleau of the Globe staff contributed to this report. Milton J. Valencia can be reached at

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